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CLAIMS

1. A method of transmitting data between stations in a cellular wireless communication system comprising a plurality of mobile stations and a plurality of base stations, the method comprising locating a plurality of base stations so that each base station has a zone of effective coverage which does not overlap with the zones of effective coverage of adjacent base stations, thereby defining zones of reduced coverage between the base stations, and relaying a data message from a sender station to a destination station via at least one relay station, wherein at least one of the sender station and the destination station is a base station, and wherein the other of said sender station and said destination station is a mobile station located within a zone of reduced coverage with respect to said base station, so that transmission of the data message from the sender station to the destination station does not interfere with adjacent base stations.

2. A method according to claim 1 wherein the destination station is a base station and the sender station is a mobile station located within a zone of reduced coverage with respect to said base station.

3. A method according to claim 1 or 2 wherein said at least one relay station is located within the zone of effective coverage of the destination base station.

4. A method according to claim 3 wherein the data message from the sender station is relayed by at least one further relay station located in a zone of reduced coverage with respect to said destination base station.

5. A method according to any one of claims 1 to 4 wherein the zones of reduced coverage with respect to each base station are zones in which at least one resource utilized by the base station is reduced.

6. A method according to claim 5 wherein the resources include transmission power, transmission time slots, frequency channels, modulation efficiency and codes.

7. A method according to claim 5 or claim 6 wherein the resources are reduced due to sharing thereof between two or more base stations in respective overlapping zones of reduced coverage of the base stations.

8. A method according to any one of claims 1 to 7 wherein the relay stations adjust their transmission power, when relaying messages to a base station or a mobile station in the zone of effective coverage of a base station, to avoid interference with said base station.

9. A method according to claim 8 wherein the relay stations adjust their usage of at least one of their transmission time slots, frequency channels, modulation efficiency and codes to avoid interference with said base station.

10. A method according to any one of claims 1 to 9 wherein the relay stations monitor data transmissions to and from base stations and/or between other mobile stations, and relay messages opportunistically when said data transmissions are not occurring, thereby sharing resources with other stations.

11. A method according to any one of claims 1 to 9 wherein the relay stations monitor data transmissions to and from base stations and/or between other mobile stations, and relay messages at a sufficiently low power level to avoid interference with said data transmissions.

12. A method according to any one of claims 1 to 11 wherein the relay stations monitor data transmissions to and from base stations and/or between other mobile stations and relay messages opportunistically, utilising higher efficiency modulation, when an increased signal to interference ratio is available, to avoid interference with said data transmissions.

13. A cellular wireless communication system comprising a plurality of mobile stations and a plurality of base stations, each station being able to transmit data to and receive data from other stations and to act as relay stations, the base stations being located so that each base station has a zone of effective coverage which does not overlap with the zones of effective coverage of adjacent base stations, thereby defining zones of reduced coverage between the base stations, the system being adapted to relay data messages from a sender station to a destination station via at least one relay station, wherein at least one of the sender station and the destination station is a base station, and wherein the other of said sender station and said destination station is a mobile station located within a zone of reduced coverage with respect to said base station, so that transmission of the data message from the sender station to the destination station does not interfere with adjacent base stations.

14. A communication system according to claim 13 wherein the zones of reduced coverage with respect to each base station are zones in which at least one resource utilized by the base station is reduced.

15. A communication system according to claim 14 wherein the resources include transmission power, transmission time slots, frequency channels, modulation efficiency and codes.

16. A communication system according to claim 14 or claim 15 wherein the resources are reduced due to sharing thereof between two or more base stations in respective overlapping zones of reduced coverage of the base stations.

17. A communication system according to any one of claims 13 to 16 wherein the mobile stations are adapted to adjust their transmission power, when relaying messages to a base station or a mobile station in the zone of effective coverage of a base station, to avoid interference with said base station.

18. A communication system according to claim 17 wherein the mobile stations are further adapted to adjust their usage of at least one of their transmission time slots, frequency channels, modulation efficiency and codes to avoid interference with said base station.

19. A communication system according to any one of claims 13 to 18 wherein the mobile stations are adapted to monitor data transmissions to and from base stations and/or between other mobile stations, and to relay messages opportunistically when said data transmissions are not occurring, thereby to share resources with other stations.

20. A communication system according to any one of claims 13 to 19 wherein the mobile stations are adapted to monitor data transmissions to

and from base stations and/or between other mobile stations, and to relay messages at a sufficiently low power level to avoid interference with said data transmissions.

21. A communication system according to any one of claims 13 to 19 wherein the mobile stations are adapted to monitor data transmissions to and from base stations and/or between other mobile stations and to relay messages opportunistically, utilising higher efficiency modulation, when an increased signal to interference ratio is available, to avoid interference with said data transmissions.

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